

**WHAT IS CLAIMED IS:**

1. A neutron detection device comprising:  
  
an active semiconductor layer including a plurality of charge-sensitive cells; and  
  
a neutron conversion layer located in close proximity to the cells.
  
2. A neutron detection device as claimed in claim 1, further comprising an  
  
insulating layer located between the active semiconductor layer and the neutron conversion  
  
layer.
  
3. A neutron detection device as claimed in claim 1, further comprising a barrier  
  
layer located between the neutron conversion layer and the active semiconductor layer.
  
4. A neutron detection device as claimed in claim 3, wherein the barrier layer  
  
comprises silicon nitride.
  
5. A neutron detection device as claimed in claim 1, wherein the neutron  
  
conversion layer comprises boron.
  
6. A neutron detection device as claimed in claim 1, wherein the neutron  
  
conversion layer comprises borosilicate glass.

7. A neutron detection device as claimed in claim 6, wherein the borosilicate glass includes 5% boron.

8. A neutron detection device as claimed in claim 1, wherein the neutron conversion layer includes lithium.

9. A neutron detection device as claimed in claim 1, further comprising a second neutron conversion layer formed in proximity to the active semiconductor layer.

10. A neutron detection device as claimed in claim 9, wherein one of the neutron conversion layers comprises boron and the other of the neutron conversion layers comprises lithium.

11. A method of manufacturing a neutron detector from a memory device, wherein the memory device includes an active semiconductor layer, a base substrate and an insulating layer between the active semiconductor layer and the base substrate, the method comprising:

removing the base substrate layer from a memory device to expose the insulating layer ; and

forming a neutron conversion layer on the insulating layer.

12. A method of manufacturing a neutron detector from a memory device as claimed in claim 11, further comprising forming a barrier layer on the insulating layer prior to forming the neutron conversion layer.

13. A method of manufacturing a neutron detector from a memory device as claimed in claim 11, further comprising forming a second neutron conversion layer on the neutron conversion layer.

14. A method of manufacturing a neutron detector from a memory device as claimed in claim 11, wherein the neutron conversion layer comprises boron.

15. A method of manufacturing a neutron detector from a memory device as claimed in claim 13, wherein the neutron conversion layer formed on the insulating layer comprises boron and the second neutron conversion layer comprises lithium.

16. A method of manufacturing a neutron detector from a memory device, wherein the memory device includes an active semiconductor layer, a base substrate and an insulating layer between the active semiconductor layer and the base substrate, the method comprising:

removing the base substrate layer and the insulating layer from the memory device;

and

forming a neutron conversion layer on the active semiconductor layer.

17. A method of manufacturing a neutron detector from a memory device as claimed in claim 16, further comprising forming a barrier layer on the active semiconductor layer prior to forming the neutron conversion layer.

18. A method of manufacturing a neutron detector from a memory device as claimed in claim 16, further comprising forming a second neutron conversion layer on the neutron conversion layer formed on the active semiconductor layer.

19. A method of manufacturing a neutron detector from a memory device as claimed in claim 16, wherein the neutron conversion layer comprises boron.

20. A method of manufacturing a neutron detector from a memory device as claimed in claim 18, wherein the neutron conversion layer formed on the insulating layer comprises boron and the second insulating layer comprises lithium.